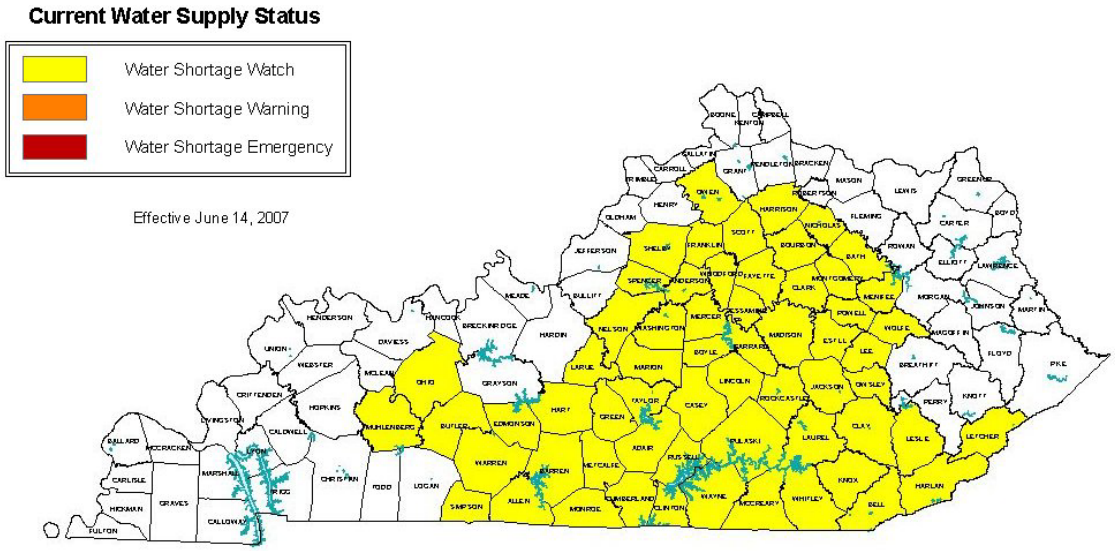
Kentucky Drought Monitoring Center

Select from the sidebar to view drought information.



Statewide Summary of Drought Development

Current for the week of June 18, 2007

UPDATE June 15 - State Declares Water Watch Shortage for 61 Counties (To view press release please click here.)

Kentucky is currently experiencing moderate to severe drought conditions as a result of a substantial deficit in precipitation that has been accumulating since November 2006. **At the present time, there have been no reported shortages at water supply intakes.** With continued dry days and warm temperatures, the potential for high demands to stress the treatment, storage, or distribution of potable water is increased. Citizens in the Water Shortage Watch area should be prepared to reduce non-essential uses of water if asked to do so by their water providers.

The outlook for the next two weeks is discouraging and indicates below normal precipitation for a large portion of the eastern United States including Kentucky. Precipitation this week may range from 0.5 to 1.0 inches in some places but overall, the impact on the hydrologic drought is expected to be very small. There may be areas that receive substantial rains from showers and thunderstorms that develop along the front that is expected to move across Kentucky on Tuesday afternoon and evening.

Drought can increase the potential for unsustainable demands from water customers to overwhelm a water supplier's ability to treat, pump or store adequate quantities of potable water. Now is the time to consider limiting outdoor water uses to those that are essential for the survival of landscaping, trees or new plantings. Refrain from car washing, hosing down of sidewalks and patios and large-scale watering of lawns that are browning and entering dormancy from the unusually dry conditions. **Above all, be aware of any statements or requests that come from your local water supplier and make every attempt to contribute to the fulfillment of those requests.**

Useful Drought Indicators

PRECIPITATION

Since the beginning of 2007, rainfall deficits have continued to build across Kentucky, culminating in May with an unusual 12- to 15-day period during which no beneficial rains fell. The month of June has begun with a substantial deficit in place ranging from 6 to 10 inches with more severe deficits located in the southern regions of the Western, Central, Bluegrass and Eastern climatic divisions. The accumulated rainfall for the months February through May rank among the top five driest in 113 years of instrumental recording for all four climatic divisions.

STREAMFLOWS

As of June 18, there are several locations at which record daily flows are being recorded including the Ohio River at Metropolis, Illinois, Green River at Paradise, Barren River near Bowling Green and Beech Fork at Maud and Bardstown in the Central and Western climatic divisions. In the Bluegrass and Eastern climatic divisions, record low daily flows are being observed in Rockcastle River at Billows, Red River near Clay City and Beaver Creek near Monticello. With only slight chances for significant precipitation this week, the potential for low flows affecting the availability of drinking water supplies will become a significant concern in many areas.

LAKE ELEVATIONS

Most small water-supply lakes are not heavily impacted at this time. Lakes under the control of the Huntington District, Louisville District and Nashville District of the U.S. Army Corps of Engineers continue to operate along their normal lake elevation curves. Two exceptions are the Barren River Reservoir in Barren County and Rough River reservoir in Breckinridge County. Barren River reservoir is having difficulty bringing the elevation to normal pool and is currently down by 7.5 feet. Discharges from the dam have been at or near the minimum release since March 20,

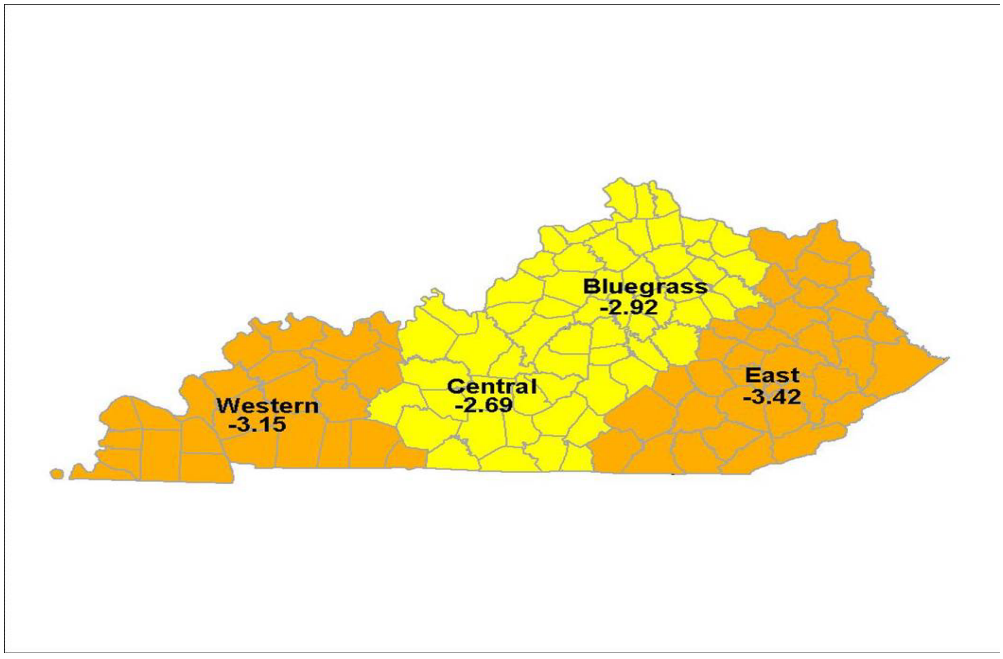
2007. Similarly, Rough River reservoir is 1.9 feet below normal pool and has been at or near to minimum release since March 16, 2007. Releases from Corps of Engineer reservoirs are important to the status of many Kentucky rivers as sources of supply for drinking water, assimilation of wastewater discharges, water quality and aquatic habitat. These rivers include the Green, Barren, Rough, Nolin, Kentucky, Salt, Licking and Big Sandy rivers.

Drought Monitoring

Current for the week of June 18, 2007

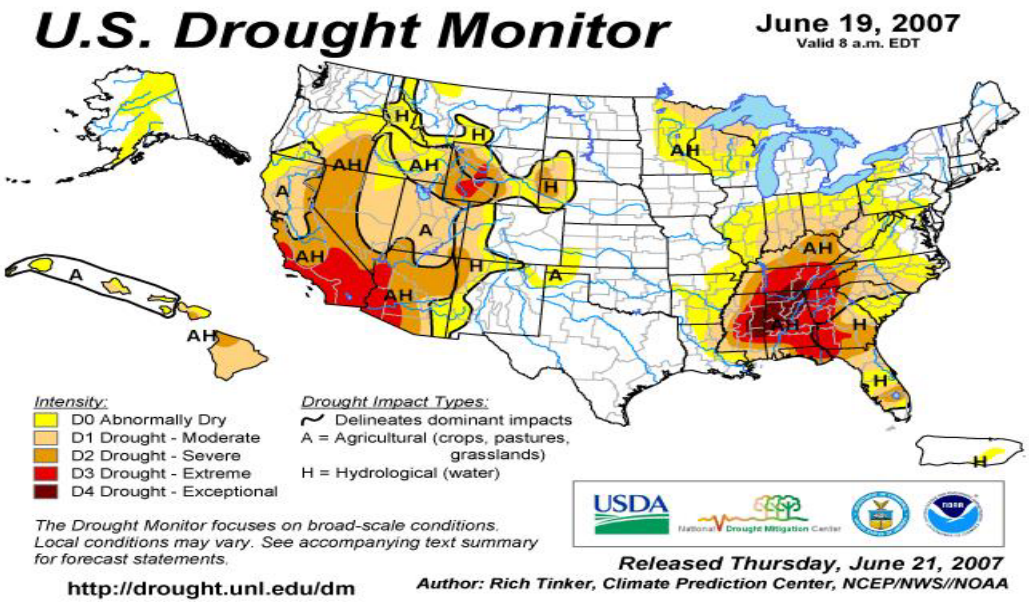
Palmer Drought Severity Index The Palmer Drought Severity Index (PDSI) is compiled weekly by the Central Region Climate Prediction Center (National Centers for Environmental Prediction, National Weather Service and National Oceanic and Atmosphere Administration) and provided on the University of Kentucky Agricultural Weather Center's Web site. This index is useful for placing a developing drought into context with past droughts and serves as a measure of current conditions. The index also provides a standardized assessment of developing drought conditions that can be compared between different areas of the state or even between different states.

PDSI values can be categorized as follows:



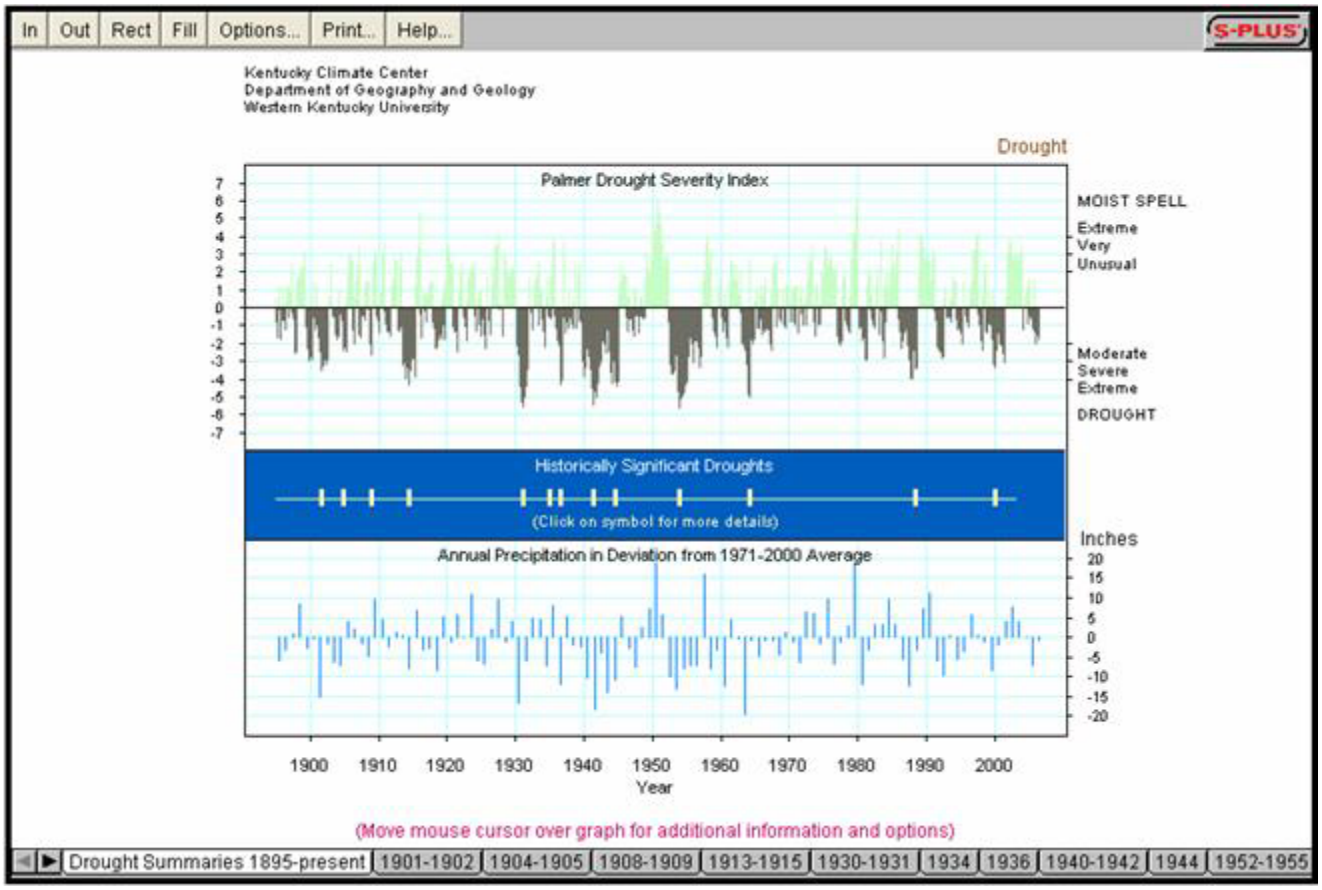
- 0 to -0.99 = near normal
- -1.00 to -1.99 = mild drought
- -2.00 to -2.99 = moderate drought
- -3.00 to -3.99 = severe drought
- -4.00 and below = extreme drought

The Drought Monitor



Tracking drought blends science and art. No single definition of drought works for all circumstances, so people rely on drought indices to detect and measure droughts. But no single index works under all circumstances, either. The Drought Monitor is a synthesis of multiple indices, outlooks and news accounts, that represents a consensus of federal and academic scientists.

Kentucky Climate Center Historical Drought Data



Interactive graphs displaying drought indices since 1895 for Kentucky's four climate divisions. Users can identify and explore the development of historically significant droughts.

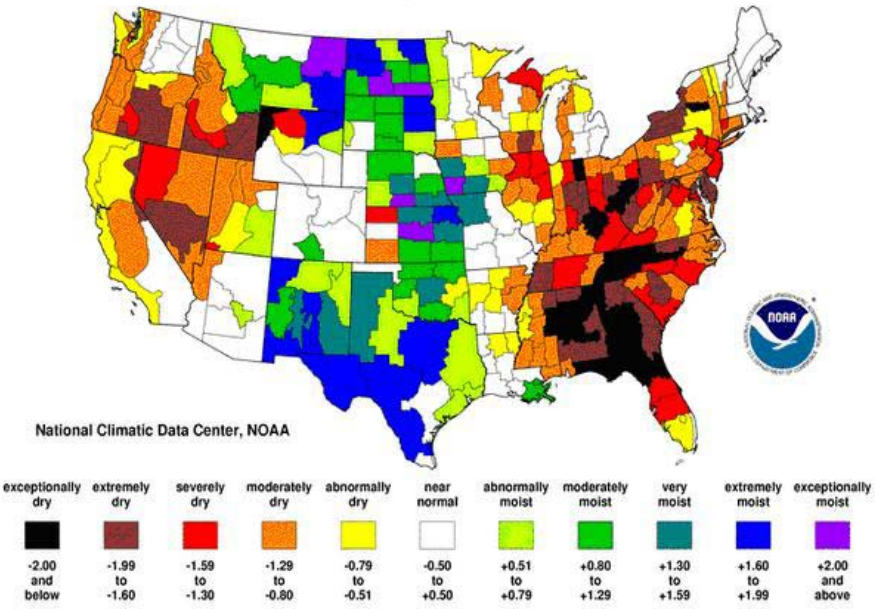
Examining the past can be a useful tool in interpreting the significance of a developing drought situation. Comparisons of the current drought to the historical record provide a frame of reference for evaluating how serious the current drought has become, and how it might develop in the coming months. One of the best tools to evaluate past droughts is found at the Kentucky Climate Center at Western Kentucky University. Click on the figure at the left to visit this site and learn more about the history of drought in Kentucky.

The Standardized Precipitation Index

The Standardized Precipitation Index (SPI) is a way of measuring drought that is different from the PDI. Like the PDI, this index is negative for drought and positive for wet conditions. But the SPI is a probability index that considers only precipitation, while Palmer's indices are water balance indices that consider water supply (precipitation), demand (evapotranspiration) and loss (runoff).

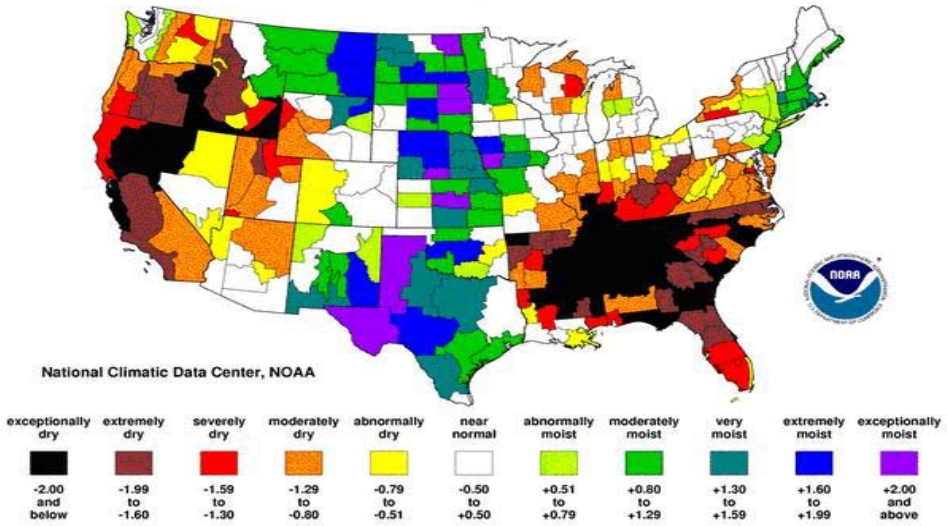
Standardized Precipitation Index
One Month

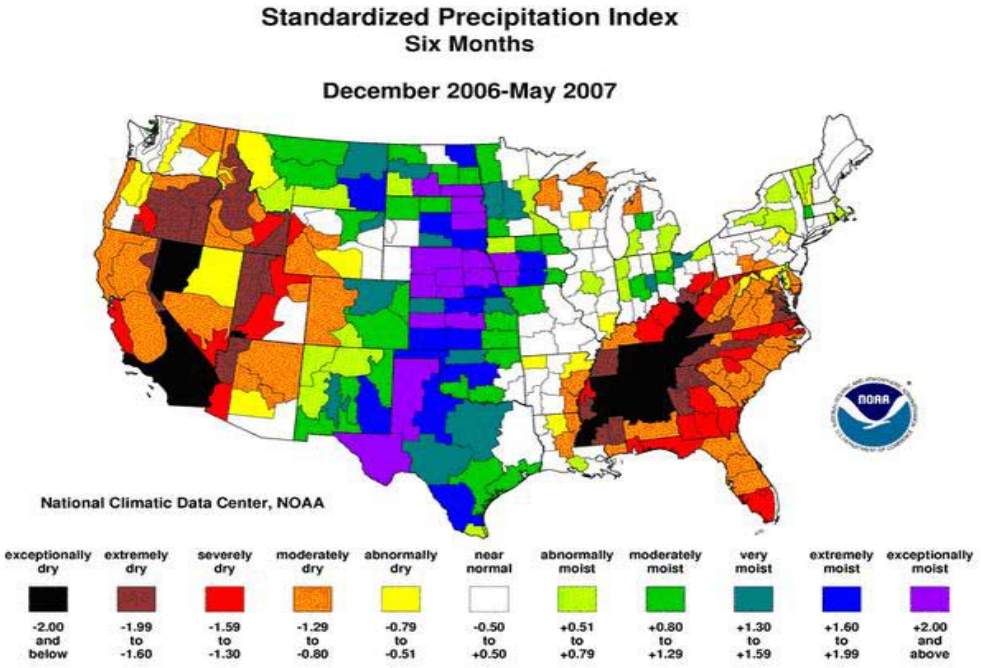
May 2007



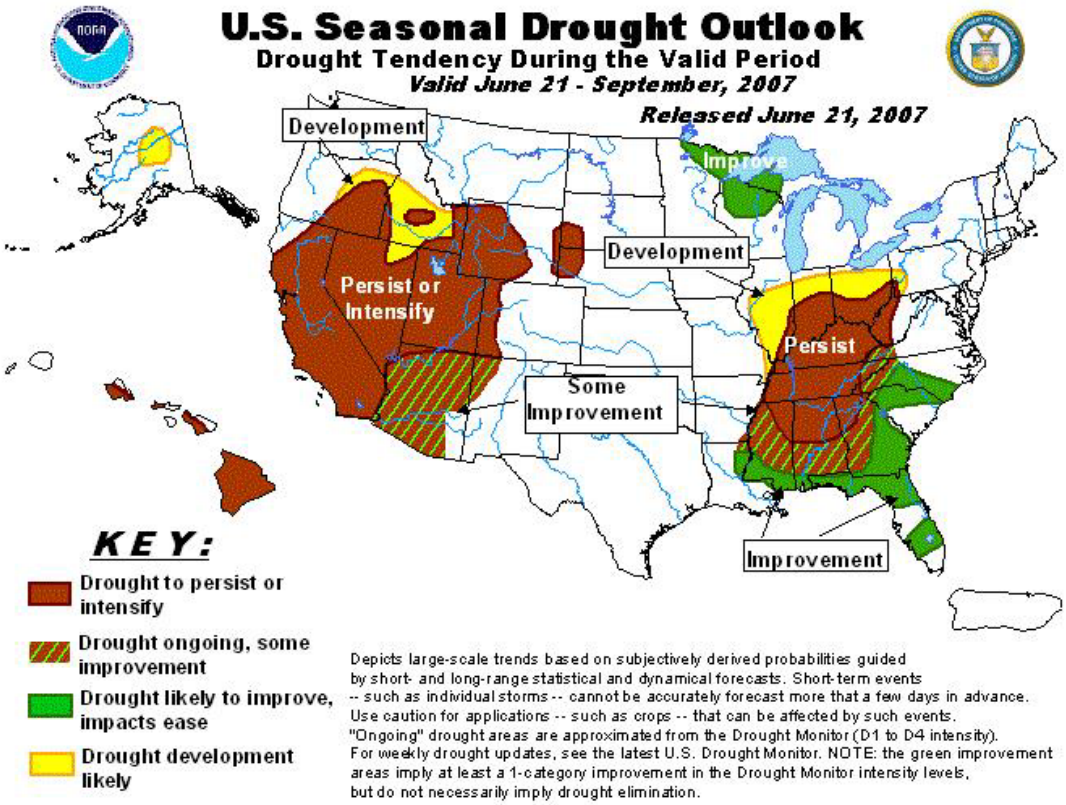
Standardized Precipitation Index
Three Months

March-May 2007





U.S. Seasonal Drought Outlook



The Climate Predication Center issues the U.S. Seasonal Drought Outlook each month in conjunction with the release of the long-lead temperature and precipitation outlooks.

Weather and Climate

PRECIPITATION

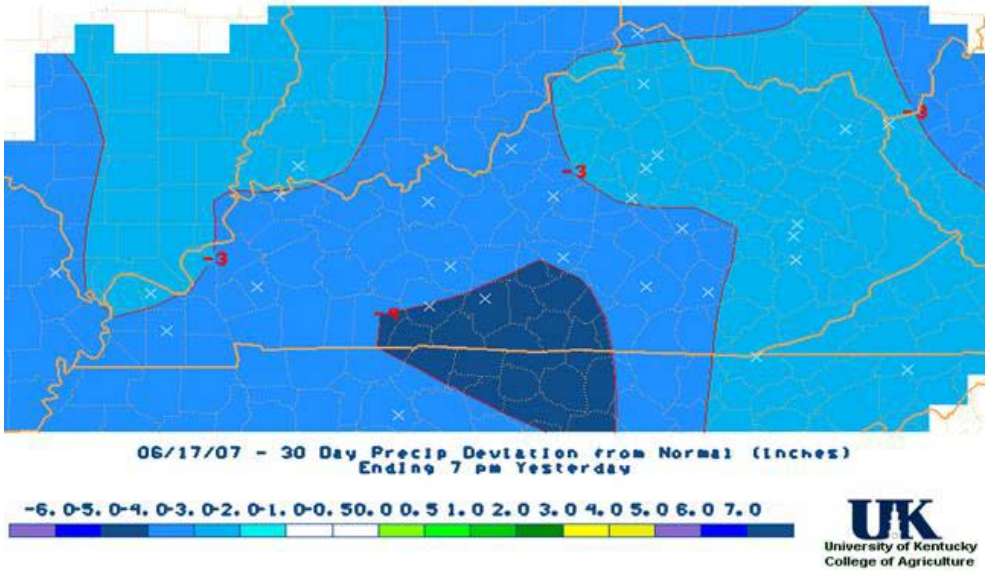
Current for the week of June 18, 2007

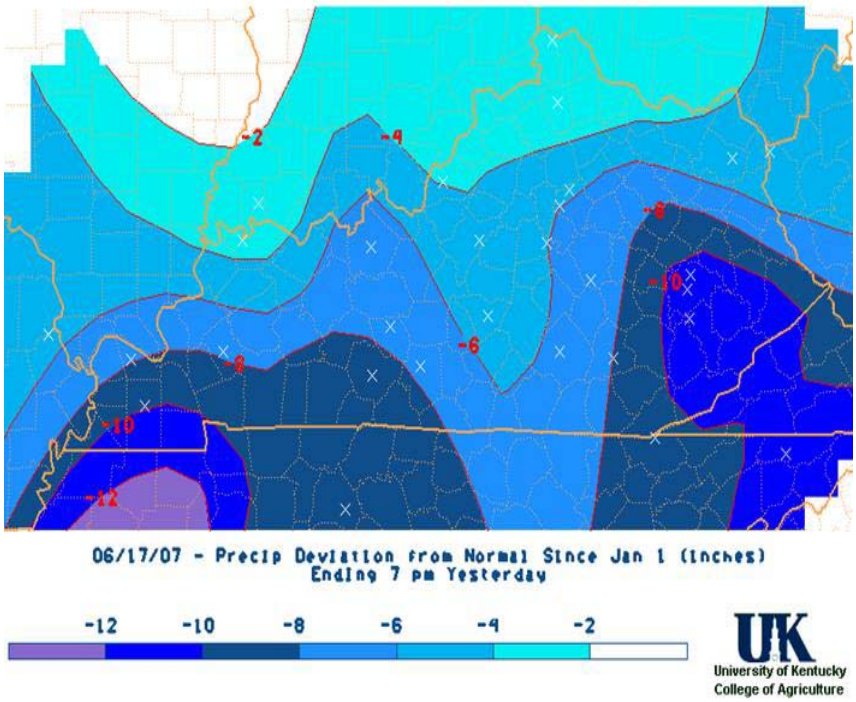
Precipitation: Data for the previous 30/60/90-day period and the Water Year Beginning October 01, 2006

Station	Water Year		30/60/90 Day Total Precipitation and Departure From Normal					
	Precipitation Totals (inches)	Departure From Normal (inches)	30 Day Total (inches)	30 Day Departure (inches)	60 Day Total (inches)	60 Day Departure (inches)	90 Day Total (inches)	90 Day Departure (inches)
Henderson	32.27	1.35	1.29	-3.28	5.88	-2.85	9.26	-4.06
Paducah	33.68	-1.04	2.32	-2.63	5.75	-4.04	8.72	-5.87
Princeton	30.11	-6.18	2.05	-2.88	5.96	-3.64	8.32	-6.07
Mayfield	27.58	-10.52	0.60	-4.16	3.85	-5.93	5.75	-9.21
Louisville	30.34	0.04	1.19	-3.26	6.33	-2.39	9.31	-3.87
Bardstown	27.05	-2.41	0.61	-3.84	5.24	-3.16	8.62	-3.98
Hardinsburg	29.47	-4.05	1.24	-3.48	5.51	-3.58	7.82	-5.70
Campbellsville	29.07	-6.24	1.69	-3.51	7.53	-2.45	11.86	-2.88
Nolin Lake	30.33	-5.12	3.35	-1.90	8.12	-1.79	10.49	-3.60
Glasgow	27.72	-8.33	1.38	-3.63	6.30	-3.32	9.49	-4.98
Bowling Green	25.25	-10.23	2.58	-2.26	6.60	-2.63	7.55	-6.52
Covington	24.60	-3.06	0.92	-3.31	3.46	-4.58	6.07	-6.02
Williamstown	32.10	2.93	1.80	-2.53	5.99	-2.51	12.43	-0.56
Spindletop	21.72	-7.66	1.30	-3.07	4.69	-3.63	7.17	-5.35
Lexington	26.89	-2.48	2.22	-2.14	5.96	-2.35	8.75	-3.76
Dix Dam	24.47	-6.36	1.26	-3.38	5.62	-3.30	9.45	-3.70
Berea	24.11	-6.60	1.49	-3.28	5.69	-3.41	9.30	-3.93
Grayson	24.78	-2.65	1.82	-2.06	5.34	-2.71	8.35	-3.19
Jackson	21.76	-9.63	1.88	-2.52	4.27	-4.27	5.67	-7.06
Quicksand	20.38	-11.12	1.87	-2.65	4.21	-4.45	5.60	-7.24
Buckhorn Lake	18.13	-12.27	0.63	-3.51	3.84	-4.09	6.00	-6.04
London	21.97	-9.18	0.96	-3.29	5.88	-2.32	6.66	-5.77
Somerset	26.75	-7.78	1.30	-3.80	5.31	-4.23	7.63	-6.30
Cumberland Gap	20.80	-14.40	0.30	-4.44	4.62	-4.30	7.75	-5.93

Climatic Division	Normal Precip. Water Year	Percent of Normal Precipitation			
		Water Year	30 Day	60 Day	90 Day
Western (1)	36.52	86	24	37	58
Central (2)	35.21	82	13	50	66
Bluegrass (3)	31.00	84	28	45	67
Eastern (4)	33.17	68	21	38	51

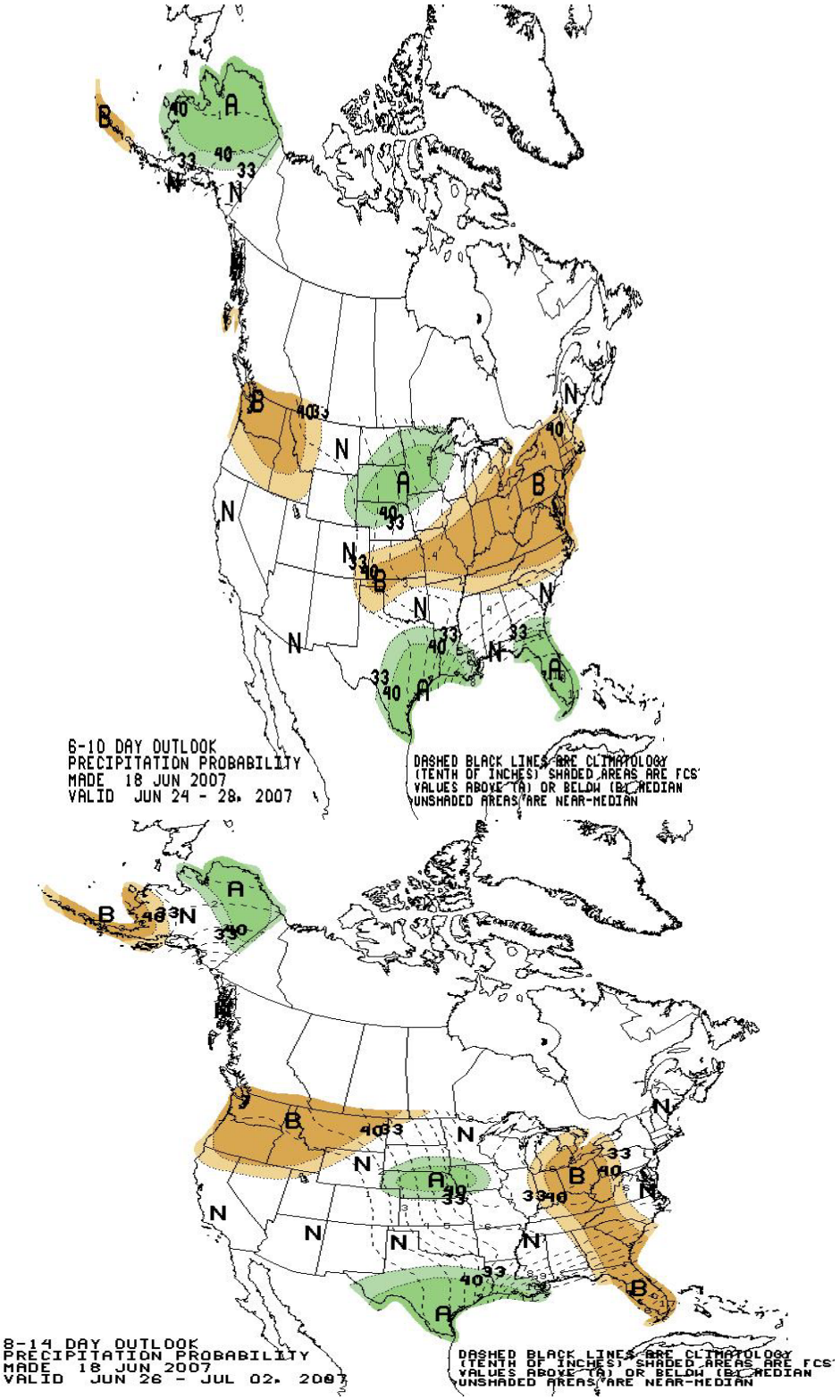
The Division of Water monitors a network of 24 daily climate-reporting stations to track developing shortages of precipitation. Precipitation deficits for the water year range from 70 percent of normal in the Eastern climatic division to 86 percent of normal in the Western climatic division. Shorter term deficits are extremely severe, ranging from 13 to 28 percent of normal within the past 30 days. Statewide, the combined rainfall for the months of February through May of this year rank as the second driest for the period since at least 1895 -- the first year of the instrumental record.





For the week of June 18 2007, the precipitation deficit for the past 30 days ranges from 3 to 4 inches below normal across Kentucky. For the year, the largest deficits occur in the southern portions of the Western and Eastern climatic divisions. Up to 10-inch deficits in precipitation have developed in parts of the Purchase area of the west and the headwaters of the Kentucky, Licking, Cumberland and Big Sandy river basins in the east. Central and northern Kentucky deficits range from 2 to 4 inches

in the extreme north and 4 to 8 inches in the Bluegrass and parts of south-central Kentucky.

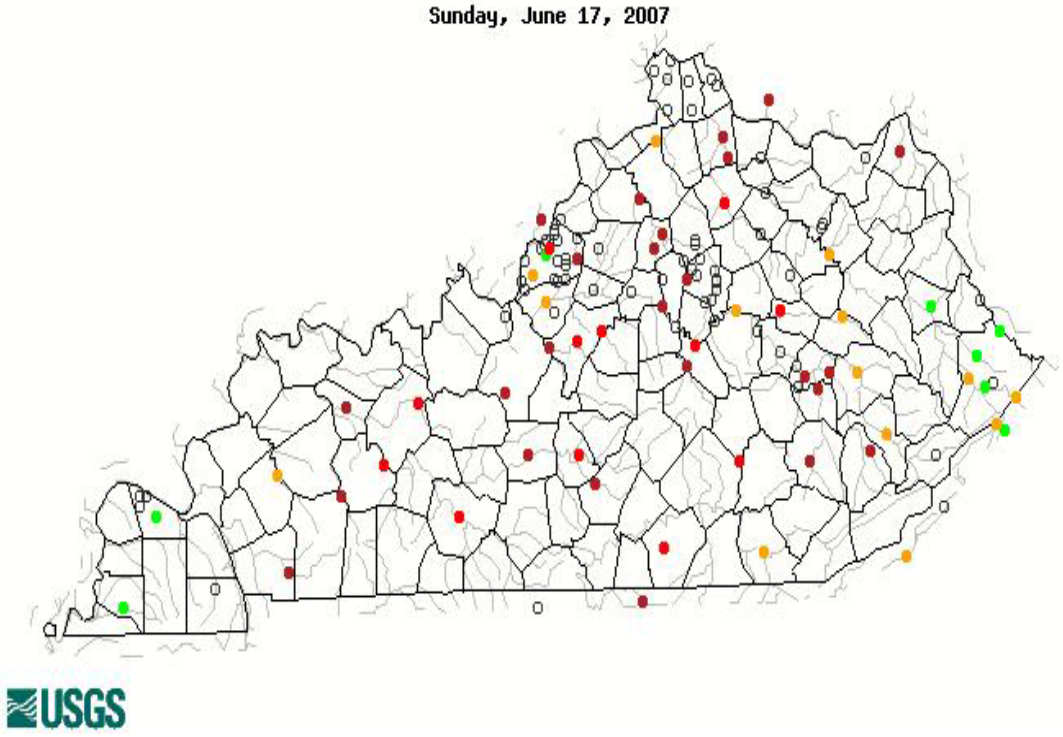


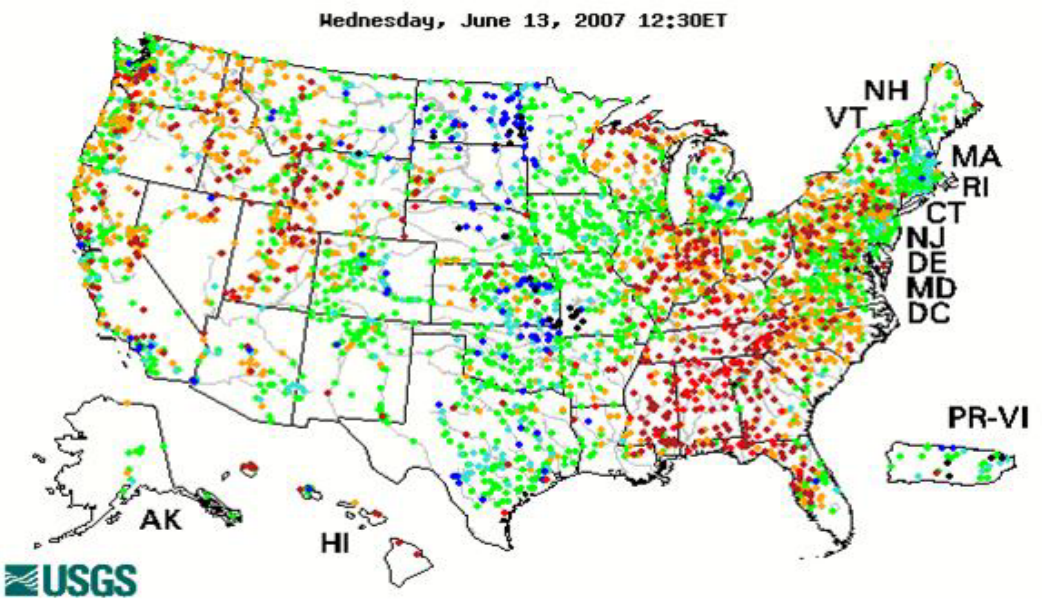
The outlook for the next two weeks is discouraging and indicates below normal precipitation for a large portion of the eastern United States including Kentucky. Precipitation this week may range from 0.5 to 1.0 inches in some places but overall, the impact on the hydrologic drought is expected to be very small. There may be areas that receive substantial rains from showers and thunderstorms that develop along the front that is expected to move across Kentucky on Tuesday afternoon and evening.

Hydrology

STREAMFLOWS

Current for the week of June 18, 2007





The U.S. Geological Survey maintains a real-time stream gauging network that monitors flows in all major river basins in Kentucky. Measurements of streamflow are a very good indicator of the longer-term hydrologic impacts of drought. During the developing stages of drought, streamflows provide valuable information on the severity and regional extent of emerging problems. Streamflow data is evaluated relative to the long-term record to determine drought intensity and identify potential problems associated with water shortages. Once a drought has matured, streamflow measurements are critical at many locations where water withdrawals have the potential to cause adverse environmental impacts to streams.

Daily average streamflows have continued to decline in most areas of Kentucky. A majority of streams across the state are flowing at moderately to severely low rates with exceptions in the Purchase region and Tradewater river basin in western Kentucky, and the Big Sandy River basin in eastern Kentucky.

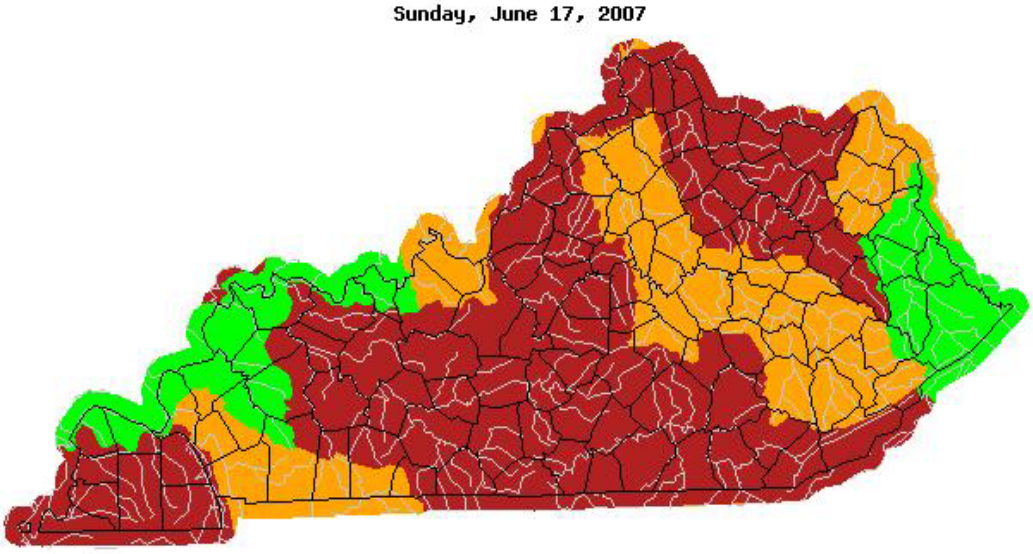
As of June 18, there are several locations at which record daily flows are being recorded including the Ohio River at Metropolis, Illinois, Green River at Paradise, Barren River near Bowling Green and Beech Fork at Maud and Bardstown in the Central and Western climatic divisions. In the Bluegrass and Eastern climatic divisions, record low daily flows are being observed in Rockcastle River at Billows, Red River near Clay City and Beaver Creek near Monticello. With only slight chances for significant precipitation this week, the potential for low flows affecting the availability of drinking water supplies will become a significant concern in many areas.

Weekly and Monthly Streamflow

For a slightly longer-term perspective of streamflow conditions across Kentucky, the United States Geological Survey computes average flows for the previous seven, 14 and 28 days. The resulting average streamflow values are categorized relative to the long-term record and assigned levels of severity based on the frequency that similar magnitudes of low flow have occurred in the past. By averaging over a

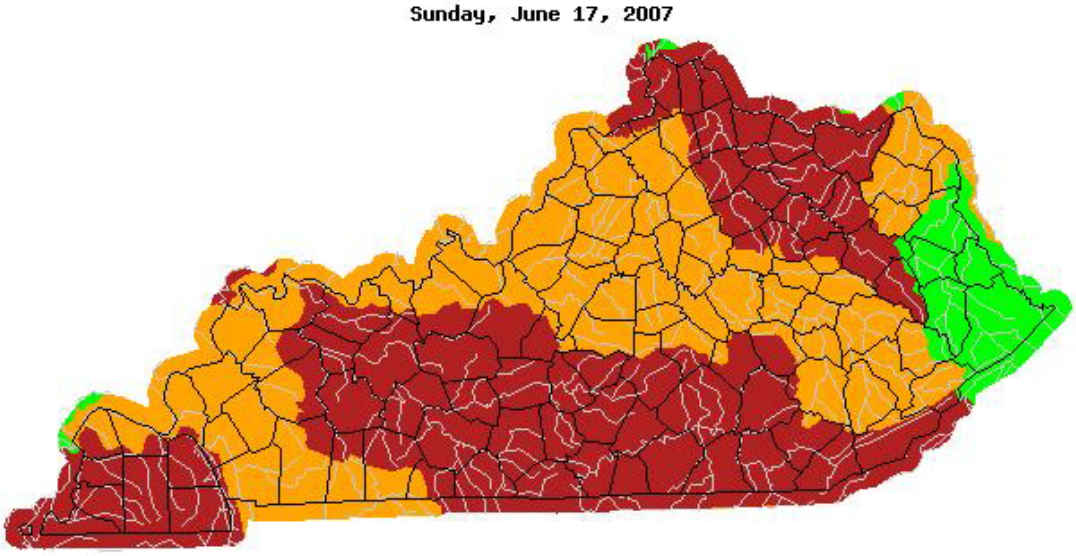
period of several days to several weeks, the values on the map are more indicative of longer-term conditions than daily average or real-time streamflow measurements.

Seven-Day Average Streamflow



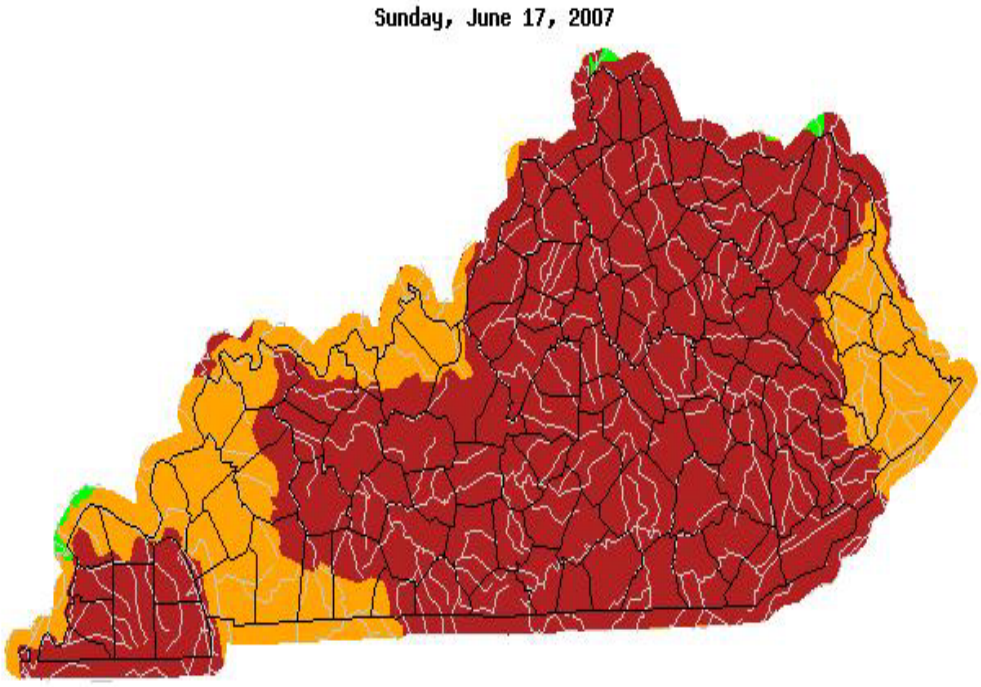
USGS

14-Day Average Streamflow



USGS

28-Day Average Streamflow



The seven, 14, and 28-day average streamflow indicates that most areas of Kentucky are experiencing substantial departures from normal flows for this time of year. Using the 28-day low flow as an indicator, all river basins except for the Lower Cumberland, Tradewater and Big Sandy have slipped into severe hydrological drought status.

Lakes and Reservoirs
U.S. Army Corps of Engineers Projects

Another useful measure of the impact that drought is having on a region is the status of area lakes and reservoirs. The Division of Water monitors data from 12 projects operated by the U.S. Army Corps of Engineers (USACE) from three USACE districts: Louisville, Huntington and Nashville. These projects strive to maintain reservoirs at pool levels consistent with the operating guidelines as part of the larger mission of flood control and navigation in the Ohio and Mississippi rivers. Beginning in April, the releases from the reservoirs are managed to allow filling to the "normal summer pool elevation." Significant precipitation deficits in the basin above the reservoir can adversely affect the attainment of normal summer pool elevation. This, in turn, may result in low flows in the river below the project when releases from the reservoir are reduced to the minimum needed for water quality and aquatic habitat.

By examining the data for "current pool elevation" and "current outflow," valuable information about the status of large headwater areas above the USACE reservoirs can be obtained.

United States Army Corps of Engineer Reservoir Information
Updated June 18, 2007

Basin	Project	Current Outflow (cfs)	Normal Summer Pool Elevation (ft)	Current Pool Elevation (ft)
Little Sandy	Grayson	17.8	645	644.0
Big Sandy	Dewey	36.8	650	650.7
	Fishtrap	82.5	757	757.2
	Yatesville	24.9	630	630.0
	Paintsville	22.3	709	709.1
Licking	Cave Run	70.0	730	730.0
Kentucky	Carr Creek	5.0	1027	1027.3
	Buckhorn	40.0	782	782.1
Salt	Taylorsville	32.0	547	546.0
Green	Green River	49.0	675	674.8
	Nolin	49.0	515	515.3
	Barren River	51.0	552	544.5
	Rough River	49.0	495	493.1

For the week of June 18, 2007, reservoir levels remain below the normal summer pool elevation at Taylorsville Lake in Spencer County, Barren River Lake in Barren County and Rough River Lake in Breckinridge County and Grayson Lake in Carter County. Lake levels and outflows are good indicators of moderate to severe drought conditions in these areas. It is noteworthy that both Barren River and Rough River lakes have been at or near the minimum release since mid-March, further evidence that the current drought conditions have been under development for some time.

Small Lakes and Water Supply Reservoirs

Water suppliers who rely on small reservoirs are acutely aware of any deviation from normal when it comes to the amount of water in their reservoir. As with the larger USACE projects, these small reservoirs are susceptible to drought impacts that can inhibit the "refilling" or "recharge" over winter and through the spring. In addition, the daily withdrawal of water for water supply can accelerate the drop in water levels so that the ability to withstand long periods of little or no precipitation is compromised.

The Division of Water will monitor selected small water supply reservoirs when conditions indicate that water supplies may be threatened by persistent drought. For the week of June 18, 2007, no reports of abnormally low reservoir levels have been reported.